



GEWORKBENCH V.1.8.0

INSTALLATION GUIDE

Document Change History

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caBIG[™] cancer Biomedical
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geWorkBench v1.8.0

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Table of Contents

Chapter 1	Overview of the Software	3
	Software Overview	3
	Minimal System Requirements.....	3
	geWorkbench Software and Technology Requirements	4
	geWorkbench Related Software (optional).....	5
Chapter 2	geWorkbench Installation	7
	Introduction	7
	Upgrading to geWorkbench 1.8.0 from Previous geWorkbench Versions*.....	7
	Installing geWorkbench.....	7
	<i>Preliminary Considerations</i>	7
	<i>Platform-specific Download and Installation Instructions</i>	7
	1. Windows (tested on XP/Vista).....	8
	2. MacOSX	8
	3. Linux.....	8
	4. Generic.....	9
	<i>Typical steps in setting up X-windows (Linux/UNIX only)</i>	10
	<i>Changing the Location of the User Preferences Directory</i>	10

Chapter 1 Overview of the Software

Software Overview

geWorkbench ([genomics Workbench](#)) is a Java-based open-source platform for integrated genomics. Using a component architecture it allows individually developed plug-ins to be configured into complex bioinformatics applications. At present there are more than 50 available plug-ins supporting the visualization and analysis of gene expression and sequence data. Example uses include:

- loading data from local or remote data sources.
- visualizing gene expression, molecular interaction networks, protein sequence and protein structure data in a variety of ways.
- providing access to client- and server-side computational analysis tools such as t-test analysis, hierarchical clustering, self organizing maps, regulatory network reconstruction, BLAST searches, pattern/motif discovery, etc.
- validating computational hypothesis through the integration of gene and pathway annotation information from curated sources as well as through Gene Ontology enrichment analysis.

geWorkbench is the Bioinformatics platform of [MAGNet](#), the **National Center for the Multi-scale Analysis of Genomic and Cellular Networks** (one of the [7 National Centers for Biomedical Computing](#) funded through the [NIH Roadmap](#)). Additionally, geWorkbench is supported by [caBIG®](#), NCI's cancer Biomedical Informatics Grid initiative.

All documentation and tutorials for geWorkbench are maintained online at <http://www.geworkbench.org>.

End-user and developer support for geWorkbench is provided through the caBIG® [Molecular Analysis Tools Knowledge Center](#), a component of the caBIG® [Enterprise Support Network](#).

Minimal System Requirements

At least 2 GB of memory is recommended, though geWorkbench can be run with less. The

amount of memory required depends on the size of the dataset being worked with. For working with larger datasets, the amount of memory allocated to Java may need to be increased. Instructions for this can be found in the [FAQ](http://www.geworkbench.org) section of www.geworkbench.org.

geWorkbench has been tested on the platforms shown in Table 1.

	Linux Server	Macintosh	Windows
Model	HP Proliant ML 330	MacPro 1.1	Dell Optiplex 745
CPU	4 x Intel® Xeon™ E5440 Processor 2.83 GHz	2 x 2.66 GHz Dual-Core Intel Xeon	1 x Intel® Core2™ Duo 6700 Processor 2.66GHz
Memory	16 GB	2 GB	3.0 GB
Local Disk	System 2 x 36GB (RAID 1) Data = 2 x 146 (RAID 1)	Intel ESB2 AHCI v.1.1 149.05 GB	System 1 x 160 GB
OS	Red Hat Linux 4.1.2-44 (Linux 2.6.18-128.el5)	MacOS X 10.5.8 (9L31a)	Windows Vista SP2
Java 2 JRE, Standard Edition	1.5.0_11-b03	1.5.0_20-b02-315	1.5.0_18

Table 1 Platform Testing Environment

geWorkbench Software and Technology Requirements

geWorkbench and other caBIG[®]-related applications require use of Java 1.5. However, the current version of Java released by Sun is version 1.6 (Java 6). To avoid any conflict with later Java versions which may be installed on a user's machine, the prebuilt Windows and Linux installers for geWorkbench include and use their own private copy of the Java 1.5 JRE. On the Macintosh platform, Mac OS X 10.5.* includes the Java 1.5 JRE as the default version of Java. However, Mac OS X 10.6.* (Snow Leopard) includes Java 1.6. While geWorkbench is believed

to work with this JRE, it has not been tested on the Macintosh platform. Table 2 summarizes geWorkbench software environment requirements.

Software Name	Version	Description	URL
Java Software Runtime Environment (JRE)	1.5.0_*, no known restrictions on exact release version.	Sun Microsystems platform-independent Java environment. Included with Windows and Linux installers.	java.sun.com
X windows (Linux/Unix platforms only)	X11 R6	Platform independent windowing system.	

Table 2 Required software and technology for geWorkbench 1.8.0

geWorkbench Related Software (optional)

geWorkbench connects with a number of outside data sources. In particular, it can download data directly from copies of NCI's caArray database for high-throughput genomics analysis results. RMAExpress is an example of a program that can be used to preprocess particular types of gene expression experiment results for input into geWorkbench. These optional software products are described further in Table 3.

Software Name	Version	Description	URL	Incl.
caArray	2.3.0	caArray is an open-source, web and programmatically accessible array data management system.	https://cabig.nci.nih.gov/tools/caArray	No
RMAExpress or similar	1.0.4	Provides RMA processing of Affymetrix CEL files, writing data to a geWorkbench-compatible tab-delimited file.	http://rmaexpress.bmbolstad.com/	No

Table 3 Optional software and technology for geWorkbench

Chapter 2 geWorkbench Installation

Introduction

Minimal requirements for geWorkbench installation are described in Chapter 1. This chapter will describe in detail how to select and install the proper version of geWorkbench for your platform.

Upgrading to geWorkbench 1.8.0 from Previous geWorkbench Versions*

Multiple versions of geWorkbench can be installed and coexist on one computer. geWorkbench versions 1.8.0 and 1.7.0 by default share a common directory structure in which user preferences are stored. Please note that running the geWorkbench uninstall process (Windows) will not remove these preference settings. If the earlier version of geWorkbench is not needed, we recommend uninstalling it prior to installing geWorkbench v1.8.0.

Installing geWorkbench

Preliminary Considerations

geWorkbench 1.8.0 has been tested with the operating systems and hardware specified in Table 1 of this guide.

Requirements for installation (in some cases) of Sun's Java Runtime Environment have been described above in Chapter 1, geWorkbench Software and Technology Requirements.

If you choose an installation type which does not include the Java Runtime Environment along with geWorkbench, you will need to make sure it is installed and properly configured on your machine.

Platform-specific Download and Installation Instructions

Several different installation packages are available for this release of geWorkbench. Those with the word "installer" in the name included an installation "wizard", a guided set of steps, and are created using the InstallAnywhere program. In contrast, the generic, non-installer based version,

geWorkbench_v1.8.0_Generic.zip, requires that the user unzip the files and set two environment variables. Please choose the most appropriate file for your platform and needs. (Installers for other platforms/configurations can be created on request).

1. Windows (tested on XP/Vista)

File: geWorkbench_v1.8.0_Windows_installer_with_JRE1.5.exe

- This version includes its own private copy of the Java 1.5 JRE bundled in, which avoids any potential conflicts with other Java versions.
- Download and double-click the selected file to begin installation.

Special note for Vista - if you run this installer on Vista, please install geWorkbench to c:\geWorkbench_1.8.0 rather than to C:\Program Files\geWorkbench_1.8.0.

Special note for Windows 7 – geWorkbench installation has not been tested yet on Windows 7 but we suggest you follow the instructions for Vista installation.

2. MacOSX

File: geWorkbench_v1.8.0_MacOSX_installer.zip

- This version relies on the Java JRE included with the MacOSX operating system. As noted above, OSX 10.5 includes Java 1.5, but OSX 10.6 includes Java 1.6 by default.
- After downloading, double-click geWorkbench_v1.8.0_MacOSX_installer.zip
- Notes
 - Requires Mac OS X 10.4 or later
 - The compressed installer should be recognized by Stuffit Expander and should automatically be expanded after downloading. If it is not expanded, you can expand it manually using StuffIt Expander 6.0 or later.

3. Linux

File: geWorkbench_v1.8.0_Linux_installer_with_JRE1.5.bin

- This version includes its own private copy of the Java 1.5 JRE bundled in, which avoids any potential problems with other Java versions.
- The Linux version of geWorkbench relies on X-Windows being installed and running. If you are running Linux on a server and e.g. Windows on your desktop, you will also need

to run an X-windows server on your desktop machine.

Installing geWorkbench under Linux

- After downloading, cd (if needed) to the directory to which you downloaded the installer.
- Type the command: "sh ./geWorkbench_v1.8.0_Linux_installer_with_JRE1.5.bin". This will extract geWorkbench into a new directory called geWorkbench_1.8.0.

Running geWorkbench user Linux

Assuming you are using the Linux bash shell, issue the command:

- `"./rungeWorkbench_1.8.0"`

4. Generic

A non-installer-based version of geWorkbench is supplied in a Zip file which will work on any platform.

File: geWorkbench_v1.8.0_Generic.zip

Installation:

- Unzip the file. It will create a directory geWorkbench1.8.0.

Setting up the Java Environment

- You will need to set two environment variables. These are the JAVA_HOME and the PATH variables. They should be configured to point to your own installation of the JRE.
- Here is an example of setting the two environment variables for a JRE installed in the directory /opt:

```
JAVA_HOME=/opt/jre1.5.0_18
```

```
PATH=/opt/jre1.5.0_18/bin:$PATH
```

Running geWorkbench (generic):

- **Windows:** you can double click on the file "launch_geWorkbench.bat" to launch geWorkbench, or run it from a command window.
- **Linux/Unix:** Execute the script "lauch_geworkbench.sh". You will need to have X-windows set up as describe above under section 3, Linux.

- **Any:** Alternatively, if you have Apache Ant installed, you can type "ant run" in the geWorkbench directory.

Typical steps in setting up X-windows (Linux/UNIX only)

Here are some typical steps to configure a remote Linux host and a local desktop X-server.

On the remote Linux host (assuming you are using the bash shell), issue the command

- "export DISPLAY=(your IP):0"

where (your IP) should be substituted with the IP address of your local desktop machine.

On your local desktop machine, you may need to

1. start the X-windows server with a command such as "startx". You may need to cd to the X11 bin directory to find this command.
2. allow remote connections with a command such as "xhost +".

Changing the Location of the User Preferences Directory

geWorkbench stores user preference settings in a series of directories, by default located under the directory .geworkbench in the user's home directory.

The location of the user preferences directory can be changed by editing the file application.properties. In the geWorkbench installation directory. The *user.setting.directory* variable sets where these preferences are stored. Here they are shown stored relative to the user's home directory.

```
# user setting directory
user.setting.directory=.geworkbench
```